

CASE REPORT

Struma Ovarii Associated with Pseudo-Meigs' Syndrome and Elevated Serum CA 125

Julie J. Huh, M.D., F. J. Montz, M.D., and Robert E. Bristow, M.D.¹

The Kelly Gynecologic Oncology Service, Department of Gynecology and Obstetrics, The Johns Hopkins Medical Institutions, Baltimore, Maryland 21287

Received January 11, 2002

Background. Struma ovarii, presenting as pseudo-Meigs' syndrome with an elevated CA 125 level, is a rare condition.

Case. A 65-year-old patient presented with ascites, hydrothorax, right ovarian mass, and elevated CA 125 level. These findings were suspicious for an ovarian malignancy. The mass was removed and revealed struma ovarii, a specialized ovarian teratoma composed predominantly of mature thyroid tissue. In the setting of ascites and hydrothorax, the condition is known as pseudo-Meigs' syndrome. This is the second reported case in the English language literature of pseudo-Meigs' syndrome with an elevated CA 125 level resulting from struma ovarii.

Conclusion. Struma ovarii is a rare cause of ascites, hydrothorax, and an elevated CA 125 level. © 2002 Elsevier Science (USA)

Key Words: pseudo-Meigs' syndrome; struma ovarii; CA 125.

CASE REPORT

A 65-year-old P6006 woman originally presented to Johns Hopkins Medical Institutions (JHMI) in March 2001 with the complaint of dyspnea. A chest computed tomography (CT) scan showed moderate bilateral pleural effusions and a 4 × 4-cm left middle lobe cavitory lesion that was originally described in 1997 and thought to be a stable fungal mass. Two separate biopsies of this lesion revealed necrotic tissue. Thoracentesis demonstrated an exudate, negative for malignancy and microorganisms. In addition, the patient was found to have marked ascites, confirmed by abdominal CT scan (Fig. 1). Paracentesis yielded 6 liters of serous fluid consistent with an exudative process. Microscopy and cytology revealed only reactive mesothelial cells. A pelvic ultrasound revealed a small, complex right adnexal mass, a calcified mass in the uterus, and a thickened endometrial stripe. Dilation and curettage was performed demonstrating only atrophic endometrium. At this time, the patient's CA 125 level was 402 U/mL and her α -fetoprotein and CEA levels were within the normal range.

The patient had multiple medical conditions including morbid obesity, with a body mass index of 53 kg/m², and a history of congestive heart failure. An echocardiogram showed an ejection fraction of 50%. In addition, she had insulin-dependent diabetes mellitus, hypertension, hypercholesterolemia, Charcot-Marie-Tooth disease, and hypothyroidism. Her thyroid-stimulating hormone level was within the normal range, at 1.09 uIU/mL. She developed a pulmonary embolism shortly after the ascites was diagnosed, and an inferior vena cava filter was subsequently placed for a lower gastrointestinal bleed while on anticoagulation therapy. In 1997, she underwent left breast lumpectomy with axillary lymph node dissection and radiation therapy for intraductal carcinoma *in situ* (Stage 0, Tis N0 M0). A recent mammogram found no suspicious masses. Colonoscopy and an esophagogastroduodenoscopy performed for guaic-positive stool revealed multiple benign colonic and duodenal polyps.

INTRODUCTION

The constellation of findings consisting of solid ovarian mass, ascites, and hydrothorax should be considered a malignant process until proven otherwise. However, pleural effusion and ascites may also be associated with an ovarian fibroma, a condition originally described by Meigs in 1937 [1]. When the same clinical features exist but involve other ovarian or gynecologic tumors, it is referred to as pseudo-Meigs' syndrome [2]. Struma ovarii rarely presents as pseudo-Meigs' syndrome [2–4], with only four reported cases found on a MEDLINE search of the English language literature. We report a second case of struma ovarii, accompanied by ascites, hydrothorax, and an elevated CA 125 level, the diagnosis of which was complicated by the patient's multiple medical problems.

¹ To whom correspondence and reprint requests should be addressed at The Kelly Gynecologic Oncology Service, Department of Gynecology and Obstetrics, The Johns Hopkins Medical Institutions, 600 North Wolfe Street, Phipps No. 289, Baltimore, MD 21287-1248. Fax: (410) 614-8718. E-mail: rbristo@jhmi.edu.



FIG. 1. Computed tomography scan of the abdomen showing marked ascites.

Despite the patient's medical comorbidity, she was taken to the operating room for an exploratory laparotomy through a vertical supraumbilical midline incision for diagnostic and therapeutic purposes. The patient was noted to have a markedly distended abdomen and large pannus such that neither pelvic organs nor suspicious masses were appreciated on examination under anesthesia. Twenty liters of straw-colored ascites was evacuated upon entering the peritoneal cavity. The uterus was enlarged to approximately 14-week size due to multiple leiomyomas. A $5 \times 4 \times 4$ -cm complex, multicystic mass, without evidence of external excrescences, had replaced the right ovary. The left ovary measured $3 \times 2.5 \times 2.5$ cm and had a similar appearance. There was no evidence of intraperitoneal spread of disease or retroperitoneal adenopathy. A frozen section of the right ovary was interpreted as struma ovarii. The final pathology revealed right struma ovarii (6 cm) with benign thyroid tissue confined to the ovary (Fig. 2), multiple uterine leiomyomas (largest 7 cm), inactive endometrium, and benign endometrial polyps (largest 1.2 cm). The left ovary, fallopian tube, appendix, and omental biopsy were histologically unremarkable, and the abdominal fluid contained no malignant cells.

The patient recovered uneventfully and was discharged home on the seventh postoperative day. Four months after her surgery, she had no evidence of ascites or pleural effusion and was symptomatically much improved from her preoperative condition.

DISCUSSION

Struma ovarii is a specialized ovarian teratoma composed entirely or predominantly of mature thyroid tissue and is usually unilateral. The incidence is variable, but it may account for approximately 1% of all ovarian neoplasms [4–6]. Despite the preponderance of thyroid tissue, only 5% of patients with this tumor have clinical features of hyperthyroidism [7]. Ascites may be present in up to one-third of cases of struma ovarii [4]. However, more uncommon is the combination of ascites and hydrothorax in association with this tumor [4].

Meigs and Cass described a rare triad consisting of ovarian fibroma/thecoma, ascites, and hydrothorax, whereby symptoms resolved with removal of the benign tumor [1]. In 1954 Meigs proposed to limit true Meigs' syndrome to benign and solid ovarian tumors with the gross appearance of a fibroma (fibroma, thecoma, and granulosa cell tumor), accompanied by ascites and hydrothorax, on the condition that excision of this benign tumor cured the patient [8]. In pseudo-Meigs' syndrome, the same symptoms occur with other benign cysts of the ovary, leiomyomas of the uterus, and teratomas [2, 9].

Several theories have been offered to explain the origin of the hydrothorax and ascites in Meigs' and pseudo-Meigs' syndrome. Ascites may be caused by transudation of interstitial edema fluid or by cyst formation within the tumor secondary to injury or necrosis [10]. A discrepancy between arterial supply to a large mass of tumor tissue and its venous and lymphatic

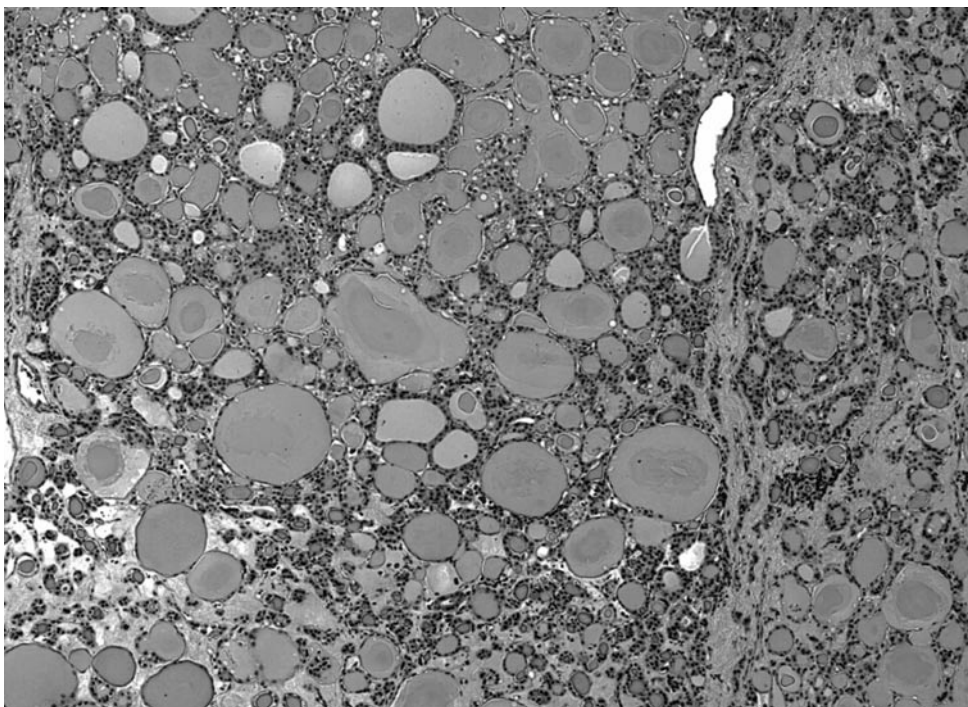


FIG. 2. Microscopic appearance of the right ovary showing thyroid follicles of varying sizes. Hematoxylin and eosin, 5 \times .

drainage may lead to stromal edema and transudation [10, 11]. Pressure on the lymphatics in the tumor itself may result in the escape of fluid through the surface lymphatics that lie just beneath the single-layered epithelium covering the tumor [10, 14]. Less likely, twisting of tumor pedicle and its torsion could cause fluid production [3]. Conceivably, a combination of leakage of intratumoral fluid, mechanical irritation from the tumor, and peritoneal inflammation result in the production of ascites [9, 12, 13]. In regard to formation of pleural fluid, mechanical transfer of ascitic fluid through the diaphragmatic apertures or through lymphatics has been suggested [4, 9]. Injection of India ink into an abdomen containing ascites has resulted in quick passage of the dye into the pleural fluid [14].

An ovarian mass and an elevated serum CA 125 level in a postmenopausal woman generally suggest a malignant process. In a series by O'Connell *et al.*, the predictive value of a CA 125 level greater than 35 U/mL was 60% for ovarian cancer and 84% for any type of malignancy [15]. Recently, elevations in serum CA 125 have been reported in cases with Meigs' syndrome [10, 13, 16]. In one report, immunohistochemical staining for CA 125 was localized to the omentum and peritoneal surfaces rather than the fibromas, and it was suggested that the expression of CA 125 and the accumulation of ascites could have resulted from some common peritoneal process [4, 13]. Leung and Hammond found that the combination of struma ovarii and elevated CA 125 has only rarely been reported [17]. In both cases, patients presented with ascites and without pleural effusions [17]. A MEDLINE search of the English

language literature provides only one case report describing struma ovarii presenting as pseudo-Meigs' syndrome with an elevated CA 125 level [7].

Our patient had recurrent and progressive ascites of unclear etiology. Paracentesis yielded serous fluid that was negative for malignancy. Nevertheless, in the setting of a complex ovarian mass in a postmenopausal woman, elevated CA 125 level, ascites, and pleural effusion, ovarian malignancy had to be excluded. Her significant medical comorbidity, including a history of congestive heart failure and morbid obesity, confounded the diagnosis. Surgical excision of the ovarian tumor effected immediate and dramatic resolution of both pleural effusion and ascites. Over 60 years after Meigs' original description of the syndrome that bears his name, his initial thoughts still apply: "The surgeon who found ascites and hydrothorax in a patient with a tumor of the abdomen or pelvis might reasonably feel that a malignant lesion was responsible. It is essential therefore that this entity be known to [them] for what could be more satisfactory than to cure such a condition by the simple removal of a benign tumor? It is hoped that by their making use of the knowledge some women will escape inevitable invalidism" [1].

REFERENCES

1. Meigs JV, Cass JW. Fibroma of the ovary with ascites and hydrothorax, with a report of seven cases. *Am J Obstet Gynecol* 1937;33:249–67.
2. Morell ND, Frost D, Ziel HK. Pseudo Meigs' syndrome: a case report. *J Reprod Med* 1980;25:88–90.

3. Kempers RD, Dockerty MB, Hoffman DL, Bartholomew LG. Struma ovarii: ascitic, hyperthyroid, and asymptomatic syndromes. *Ann Intern Med* 1970;72:883-93.
4. Amr SS, Hassan AA. Struma ovarii with pseudo-Meigs' syndrome. *Eur J Obstet Gynecol Reprod Biol* 1994;55:205-8.
5. Ayhan A, Yanik F, Tuncer R, Tuncer ZS, Ruacan S. Struma ovarii. *Int J Gynecol Obstet* 1993;42:143-46.
6. Russell P, Bannatyne P. Surgical pathology of the ovaries. London: Churchill Livingstone, 1989:441-4.
7. Bethune M, Quinn M, Rome R. Struma ovarii presenting as acute pseudo-Meigs syndrome with an elevated CA 125 level. *Aust NZ J Obstet Gynaecol* 1996;36(3):372-3.
8. Meigs JV. Fibroma of the ovary with ascites and hydrothorax-Meigs' syndrome. *Am J Obstet Gynecol* 1954;67:962-87.
9. Jimerson SD. Pseudo-Meigs' syndrome: an unusual case with analysis of the effusions. *Obstet Gynecol* 1973;42:535-7.
10. Timmerman D, Moerman P, Vergote I. Meigs' syndrome with elevated serum CA 125 levels: two case reports and review of the literature. *Gynecol Oncol* 1995;59:405-8.
11. Samanth KK, Black WC III. Benign ovarian stromal tumors associated with free peritoneal fluid. *Am J Obstet Gynecol* 1970;107:538-45.
12. Amant F, Gabriel C, Timmerman D, Vergote I. Pseudo-Meigs' syndrome caused by a hydropic degenerating uterine leiomyoma with elevated CA 125. *Gynecol Oncol* 2001;83:153-7.
13. Lin JY, Angel C, Sickel JZ. Meigs syndrome with elevated serum CA 125. *Obstet Gynecol* 1992;80:563-6.
14. Meigs JV, Armstrong SH, Hamilton HH. A further contribution to the syndrome of fibroma of the ovary with fluid in the abdomen and chest, Meigs' syndrome. *Am J Obstet Gynecol* 1943;46:19-33.
15. O'Connell GJ, Ryan E, Murphy KJ, Prefontaine M. Predictive value of carbohydrate antigen-125 for ovarian carcinoma in patients presenting with pelvic masses. *Obstet Gynecol* 1987;70:930-2.
16. Jones OW III, Surwit EA. Meigs syndrome with elevated serum CA 125. *Obstet Gynecol* 1989;73:520-1.
17. Leung YC, Hammond IG. Limitations of CA 125 in the preoperative evaluation of a pelvic mass: struma ovarii and ascites. *Aust NZ J Obstet Gynaecol* 1993;33:216-7.